

WHAT IS CLAIMED IS

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1. A gateway unit that is connected to a packet network and a PSTN and realizes a real-time facsimile communication between a facsimile apparatus on the PSTN and a partner terminal unit, such as another gateway unit and a network facsimile apparatus, on the packet network, wherein an allocation demand for required network bandwidth is issued to a gatekeeper unit on the packet network prior to starting a communication, the communication through the packet network is performed within an allocated network bandwidth allocated by the gatekeeper unit in response to the allocation demand, while a packetized facsimile control signal received from the partner terminal unit through the packet network is converted in real-time into a modem signal and transmitted to the facsimile apparatus through the PSTN, and a facsimile control signal received from the facsimile apparatus through the PSTN as a modem signal is packetized in real-time and transmitted to the partner terminal unit through

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the packet network, comprising:

transmission speed/network bandwidth
adjusting means for adjusting the required network
bandwidth corresponding to a transmission speed set
5 up between the facsimile apparatus and the partner
terminal unit to become equal to or narrower than
the allocated network bandwidth.

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2. The gateway unit as claimed in claim 1,
wherein the transmission speed/network bandwidth
adjustment means adjusts such that the required
15 network bandwidth becomes equal to or narrower than
the allocated network bandwidth by demanding network
bandwidth allocation with a predetermined network
bandwidth specified when the demand for the network
bandwidth allocation is issued to the gatekeeper
20 unit prior to starting a communication.

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3. The gateway unit as claimed in claim 1,

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wherein the transmission speed/network bandwidth adjustment means adjusts such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth, by demanding a

5 reassignment of network bandwidth of the gatekeeper unit where the required network bandwidth corresponding to a predetermined transmission speed provided by the facsimile control signal received from the partner terminal unit in the packet network

10 on the receiving side, or from the facsimile apparatus in the PSTN on the receiving side is wider than the allocated network bandwidth allocated by the gatekeeper unit at starting the communication.

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4. The gateway unit as claimed in claim 1, wherein the transmission speed/network bandwidth

20 adjustment means adjusts such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth where the required network bandwidth corresponding to a predetermined transmission speed provided by the facsimile control

25 signal received from the partner terminal unit in

the packet network on the receiving side is wider than the allocated network bandwidth, by altering information content indicative of the transmission speed in the facsimile control signal to a transmission speed that requires equal to or narrower than the allocated network bandwidth, converting the facsimile control signal into a modem signal and transmitting the modem signal to the facsimile apparatus in the PSTN on the transmitting side.

5. The gateway unit as claimed in claim 1, wherein the transmission speed/network bandwidth adjustment means adjusts such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth, where the required network bandwidth corresponding to a predetermined transmission speed provided by the facsimile control signal received from the facsimile apparatus in the PSTN on the receiving side is wider than the allocated network bandwidth, by altering information content indicative of the transmission speed in the

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facsimile control signal to a transmission speed that requires bandwidth equal to or narrower than the allocated network bandwidth, converting the facsimile control signal into a packet and

5 transmitting the packet to the partner terminal unit in the packet network.

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6. The gateway unit as claimed in claim 1, wherein the transmission speed/network bandwidth adjustment means adjusts such that the required network bandwidth becomes equal to or narrower than

15 the allocated network, where the required network corresponding to a predetermined transmission speed provided by the facsimile control signal received from the facsimile apparatus in the PSTN on the transmitting side is wider than the allocated
20 network bandwidth, by transmitting a dummy training failure signal to the facsimile apparatus on the transmission side in response to a predetermined modem training signal received from the facsimile apparatus in the PSTN on the transmitting side,
25 until the required network bandwidth corresponding

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to a transmission speed provided by the facsimile control signal that will be retransmitted from the facsimile apparatus on the transmitting side becomes equal to or narrower than the allocated network

5 bandwidth.

10 7. The gateway unit as claimed in claim 1, wherein the transmission speed/network bandwidth adjustment means adjusts such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth, where the required
15 network bandwidth corresponding to a predetermined transmission speed provided by the facsimile control signal received from the partner terminal unit in the packet network on the transmitting side is wider than the allocated network bandwidth, by
20 transmitting a dummy training failure signal to the partner terminal unit on the transmitting side in response to a modem training signal received from the partner terminal unit in the packet network on the transmitting side, until the required network
25 bandwidth corresponding to a transmission speed

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provided by the facsimile control signal that will be retransmitted from the partner terminal unit on the transmitting side becomes equal to or narrower than the allocated network bandwidth.

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8. A gateway unit that can be connected to
10 a packet network, comprising:

communication control means that enables a communication between a communication apparatus connected to the packet network and another communication apparatus connected to a PSTN, by
15 demanding network bandwidth allocation to a gatekeeper unit in the packet network; and

transmission speed/network bandwidth adjustment means that adjusts required network bandwidth corresponding to a transmission speed set
20 up by the communication apparatus in the packet network and the communication apparatus in the PSTN, to become equal to or narrower than network bandwidth allocated by the gatekeeper unit.

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9. A gateway unit that can be connected to a packet network, comprising:

- 5 network facsimile communication control means that enables a facsimile communication with a communication apparatus in the packet network;
- communication control means that enables a communication between a communication apparatus
- 10 connected to the packet network and another communication apparatus connected to a PSTN, by demanding network bandwidth allocation to a gatekeeper unit in the packet network; and
- transmission speed/network bandwidth
- 15 adjustment means that adjusts required network bandwidth corresponding to a transmission speed set up by the communication apparatus in the packet network and the communication apparatus in the PSTN, to become equal to or narrower than network
- 20 bandwidth allocated by the gatekeeper unit.

- 25 10. A gateway unit that can be connected

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to a packet network, comprising:

facsimile communication control means that enables a facsimile communication with a communication apparatus in a PSTN;

5 communication control means that enables a communication between a communication apparatus connected to the packet network and another communication apparatus connected to the PSTN, by demanding network bandwidth allocation of a gatekeeper unit in the packet network; and

10 transmission speed/network bandwidth adjustment means that adjusts required network bandwidth corresponding to a transmission speed set up by the communication apparatus in the packet network and the communication apparatus in the PSTN, to become equal to or narrower than network bandwidth allocated by the gatekeeper unit.

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11. A gateway controlling method which controls a gateway unit that is connected to a packet network and a PSTN and realizes a real-time
25 facsimile communication between a facsimile

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apparatus on the PSTN and a partner terminal unit,
such as another gateway unit and a network facsimile
apparatus, on the packet network, wherein a demand
for network bandwidth allocation is issued to a
5 gatekeeper unit on the packet network prior to
starting a communication, the communication through
the packet network is performed within an allocated
network bandwidth allocated by the gatekeeper unit
in response to the demand, while a packetized
10 facsimile control signal received from the partner
terminal unit through the packet network is
converted in real-time into a modem signal and
transmitted to the facsimile apparatus through the
PSTN, and a facsimile control signal received from
15 the facsimile apparatus through the PSTN as a modem
signal is packetized in real-time and transmitted to
the partner terminal unit through the packet network,
comprising:

a controlling method configured to control
20 the gateway unit which performs an adjustment such
that required network bandwidth corresponding to a
transmission speed set up between the facsimile
apparatus and the partner terminal unit becomes
equal to or narrower than the allocated network
25 bandwidth.

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5 12. The gateway controlling method as
claimed in claim 11, wherein the adjustment is
performed such that the required network bandwidth
becomes equal to or narrower than the allocated
network bandwidth by demanding network bandwidth
10 allocation with a predetermined network bandwidth
specified when the demand for network bandwidth
allocation is issued to the gatekeeper unit prior to
starting a communication.

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 13. The gateway controlling method as
claimed in claim 11, wherein the adjustment is
20 performed such that the required network bandwidth
becomes equal to or narrower than the allocated
network bandwidth, by demanding the required network
bandwidth of the gatekeeper unit for a reassignment
of network bandwidth where the required network
25 bandwidth corresponding to a predetermined

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transmission speed provided by the facsimile control
signal received from the partner terminal unit in
the packet network on the receiving side, or from
the facsimile apparatus in the PSTN on the receiving
5 side is wider than the allocated network bandwidth
allocated by the gatekeeper unit at starting the
communication.

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14. The gateway controlling method as
claimed in claim 11, wherein the adjustment is
performed such that the required network bandwidth
15 becomes equal to or narrower than the allocated
network bandwidth where the required network
bandwidth corresponding to a predetermined
transmission speed provided by the facsimile control
signal received from the partner terminal unit in
20 the packet network on the receiving side is wider
than the allocated network bandwidth, by altering
information content indicative of the transmission
speed in the facsimile control signal to a
transmission speed that requires equal to or
25 narrower than the allocated network bandwidth,

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converting the facsimile control signal into a modem signal and transmitting the modem signal to the facsimile apparatus in the PSTN on the transmitting side.

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15. The gateway controlling method as
10 claimed in claim 11, wherein the adjustment is performed such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth, where the required network bandwidth corresponding to a predetermined
15 transmission speed provided by the facsimile control signal received from the facsimile apparatus in the PSTN on the receiving side is wider than the allocated network bandwidth, by altering information content indicative of the transmission speed in the
20 facsimile control signal to a transmission speed that requires bandwidth equal to or narrower than the allocated network bandwidth, converting the facsimile control signal into a packet and transmitting the packet to the partner terminal unit
25 in the packet network.

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5 16. The gateway controlling method as
claimed in claim 11, wherein the adjustment is
performed such that the required network bandwidth
becomes equal to or narrower than the allocated
network, where the required network corresponding to
10 a predetermined transmission speed provided by the
facsimile control signal received from the facsimile
apparatus in the PSTN on the transmitting side is
wider than the allocated network bandwidth, by
transmitting a dummy training failure signal in
15 response to a predetermined modem training signal
received from the facsimile apparatus in the PSTN on
the transmitting side, until the required network
bandwidth corresponding to a transmission speed
provided by the facsimile control signal that will
20 be retransmitted from the facsimile apparatus on the
transmitting side becomes equal to or narrower than
the allocated network bandwidth.

17. The gateway controlling method as claimed in claim 11, wherein an adjustment is performed such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth, where the required network bandwidth corresponding to a predetermined transmission speed provided by the facsimile control signal received from the partner terminal unit in the packet network on the transmitting side is wider than the allocated network bandwidth, by transmitting a dummy training failure signal to the partner terminal unit on the transmitting side in response to a modem training signal received from the partner terminal unit in the packet network on the transmitting side, until the required network bandwidth corresponding to a transmission speed provided by the facsimile control signal that will be retransmitted from the partner terminal unit on the transmitting side becomes equal to or narrower than the allocated network bandwidth.

18. A communication system that realizes a
real-time facsimile communication between a
facsimile apparatus on a PSTN and a partner terminal
unit, such as another gateway unit and a network
5 facsimile apparatus, on a packet network, wherein a
gateway unit connected to the packet network and the
PSTN issues a demand for network bandwidth
allocation to a gatekeeper unit on the packet
network prior to starting a communication, and the
10 communication through the packet network is
performed within an allocated network bandwidth
allocated by the gatekeeper unit in response to the
demand, while a packetized facsimile control signal
received from the partner terminal unit through the
15 packet network is converted in real-time into a
modem signal and transmitted to the facsimile
apparatus through the PSTN, and a facsimile control
signal received from the facsimile apparatus through
the PSTN as a modem signal is packetized in real-
20 time and transmitted to the partner terminal unit
through the packet network, the gateway unit
comprising:

transmission speed/network bandwidth
adjusting means for adjusting required network
25 bandwidth corresponding to a transmission speed set

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up between the facsimile apparatus and the partner terminal unit to become equal to or narrower than the allocated network bandwidth.

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19. The communication system as claimed in claim 18, wherein the transmission speed/network bandwidth adjustment means adjusts such that the required network bandwidth becomes equal to or narrower than the allocated network bandwidth by demanding network bandwidth allocation with a predetermined network bandwidth specified when the demand for network bandwidth allocation is issued to the gatekeeper unit prior to starting a communication.

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20. The communication system as claimed in claim 18, wherein the transmission speed/network bandwidth adjustment means adjusts such that the required network bandwidth becomes equal to or

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narrower than the allocated network bandwidth, by
demanding a reassignment of network bandwidth of the
gatekeeper unit against the allocated network
bandwidth where the required network bandwidth
5 corresponding to a predetermined transmission speed
provided by the facsimile control signal received
from the partner terminal unit in the packet network
on the receiving side, or from the facsimile
apparatus in the PSTN on the receiving side is wider
10 than the allocated network bandwidth allocated by
the gatekeeper unit at starting the communication.

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21. The communication system as claimed in
claim 18, wherein the transmission speed/network
bandwidth adjustment means adjusts such that the
required network bandwidth becomes equal to or
20 narrower than the allocated network bandwidth where
the required network bandwidth corresponding to a
predetermined transmission speed provided by the
facsimile control signal received from the partner
terminal unit in the packet network on the receiving
25 side is wider than the allocated network bandwidth,

by altering information content indicative of the
transmission speed in the facsimile control signal
to a transmission speed that requires equal to or
narrower than the allocated network bandwidth,
5 converting the facsimile control signal into a modem
signal and transmitting the modem signal to the
facsimile apparatus in the PSTN on the transmitting
side.

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22. The communication system as claimed in
claim 18, wherein the transmission speed/network
15 bandwidth adjustment means adjusts such that the
required network bandwidth becomes equal to or
narrower than the allocated network bandwidth, where
the required network bandwidth corresponding to a
predetermined transmission speed provided by the
20 facsimile control signal received from the facsimile
apparatus in the PSTN on the receiving side is wider
than the allocated network bandwidth, by altering
information content indicative of the transmission
speed in the facsimile control signal to a
25 transmission speed that requires bandwidth equal to

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or narrower than the allocated network bandwidth,
converting the facsimile control signal into a
packet and transmitting the packet to the partner
terminal unit in the packet network.

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10 23. The communication system as claimed in
claim 18, wherein the transmission speed/network
bandwidth adjustment means adjusts such that the
required network bandwidth becomes equal to or
narrower than the allocated network, where the
required network corresponding to a predetermined
15 transmission speed provided by the facsimile control
signal received from the facsimile apparatus in the
PSTN on the transmitting side is wider than the
allocated network bandwidth, by transmitting a dummy
training failure signal in response to a
20 predetermined modem training signal received from
the facsimile apparatus in the PSTN on the
transmitting side, until the required network
bandwidth corresponding to a transmission speed
provided by the facsimile control signal that will
25 be retransmitted from the facsimile apparatus on the

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transmitting side becomes equal to or narrower than the allocated network bandwidth.

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24. The communication system as claimed in claim 18 wherein the transmission speed/network bandwidth adjustment means adjusts such that the
10 required network bandwidth becomes equal to or narrower than the allocated network bandwidth, where the required network bandwidth corresponding to a predetermined transmission speed provided by the facsimile control signal received from the partner
15 terminal unit in the packet network on the transmitting side is wider than the allocated network bandwidth, by transmitting a dummy training failure signal to the partner terminal unit on the transmitting side in response to a modem training
20 signal received from the partner terminal unit in the packet network on the transmitting side, until the required network bandwidth corresponding to a transmission speed provided by the facsimile control signal that will be retransmitted from the partner
25 terminal unit on the transmitting side becomes equal

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to or narrower than the allocated network bandwidth.

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